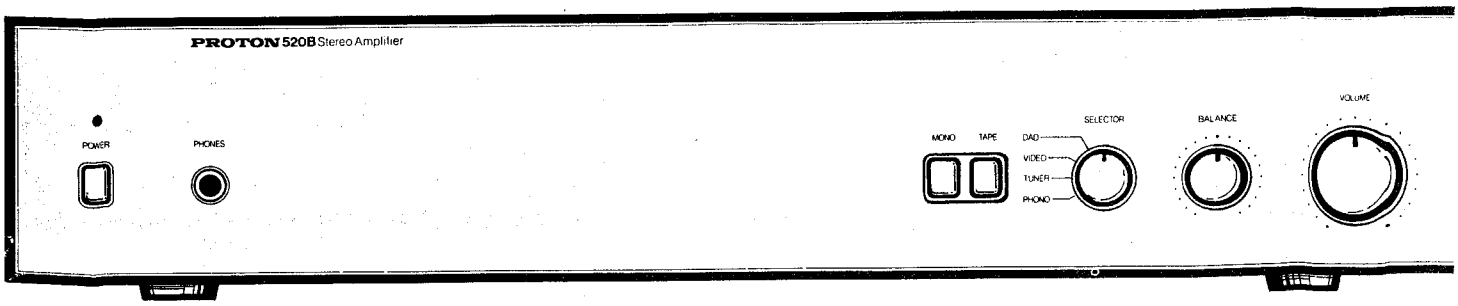
PROTON

SERVICE MANUAL

520B

STEREO AMPLIFIER



CONTENTS

SPECIFICATION..... 1
ALIGNMENT..... 2
BLOCK DIAGRAM..... 3
WIRING DIAGRAM..... 4
CIRCUIT DIAGRAM..... 5
PCB PARTS LOCATION(TOP VIEW)..... 6
PCB PARTS LOCATION (BOTTOM VIEW)..... 7
ELECTRICAL PARTS LIST..... 8
MECHANICAL PARTS LIST..... 8
ASSEMBLY DIAGRAM..... 9
PACKING DIAGRAM.....10

SPECIFICATION

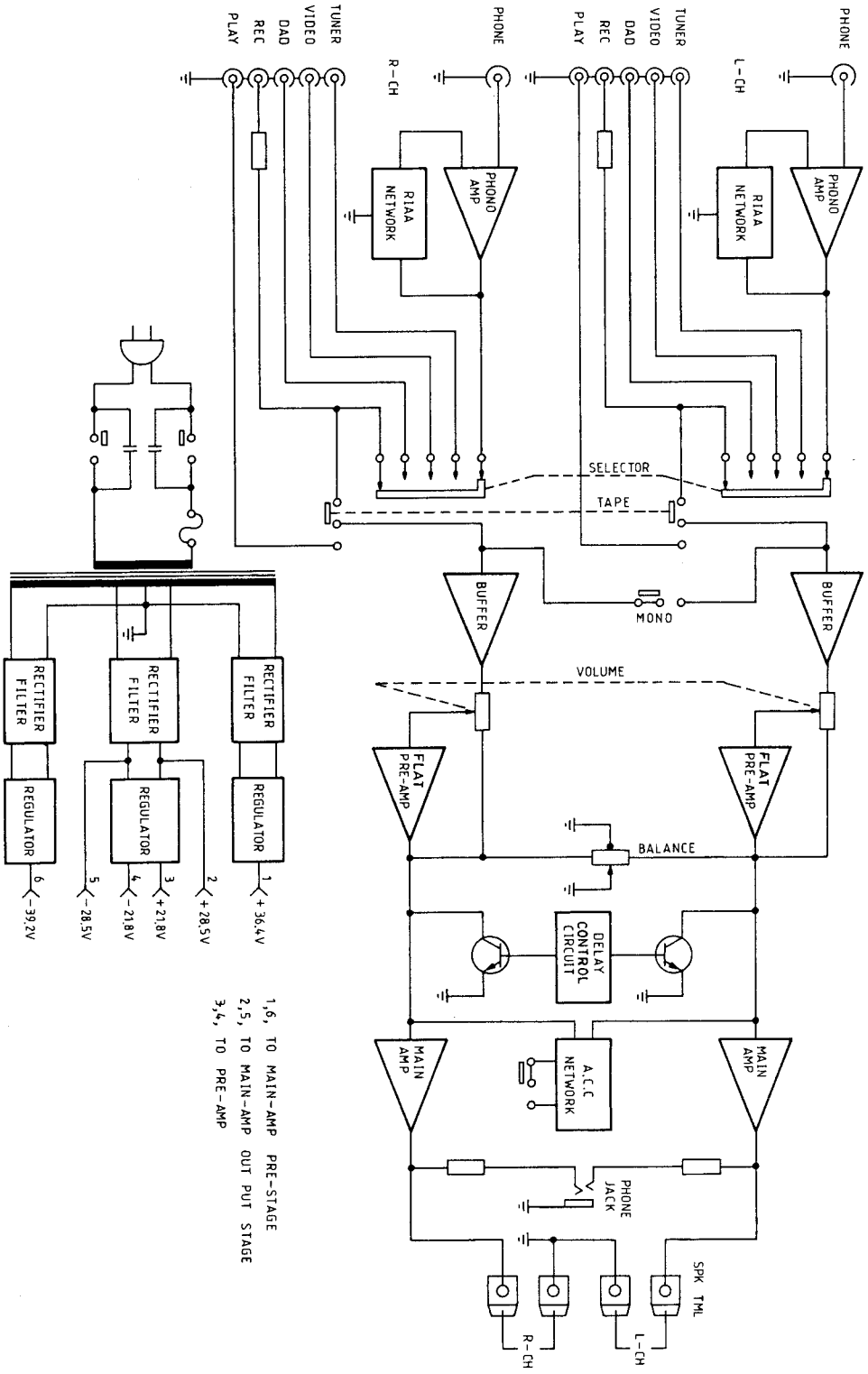
T.H.D. at Rated Power 20W:	0.015%
I.M.D. at Rated Power 20W:	0.015%
Clipping Power at 8 OHM/4 OHM/2 OHM:	26W/35W/39W
Dynamic Power at 8 OHM/4 OHM/2 OHM:	46W/78W/100W
Damping Factor:	>300
Frequency Response 20-20kHz:	±0.5dB
Power Bandwidth at T.H.D. 0.1%	10-60kHz
High Level Input Resistance/Capacitance:	15K OHM/220pF
Line Input Sensitivity (Video):	150mV
(Tape Play):	150mV
(Phono):	2.5mV
Residual Noise (Flat):	0.3mV
Channel Crosstalk (1kHz):	65dB
Function Crosstalk (1kHz):	70dB
S/N Ratio (A-Weighted) (AUX):	96dB
(Tape Play):	96dB
(Phono):	87dB
Phono Input Resistance:	47K OHM
Phono Overload @ T.H.D. 0.1% (20Hz/1kHz/20kHz);	20mV/200mV/2V
Phono T.H.D. at 4.5V Output:	0.03%
RIAA Response Accuracy:	±0.2dB
Power Supply:	
U.S.A. and Canadian Models	120V/60Hz
Eurpoean Model	220V/50Hz
British and Australian Models	240V/50Hz
Other Area Model (General Model)	110V,120V,220V,240V/50,60Hz
Dimensions WxHxD (inch):	16-1/2"x3-7/16"x11"
(cm):	42.0x8.7x28.0
Net Weight:	5.2Kg/11.44Lbs

ALIGNMENT INSTRUCTION

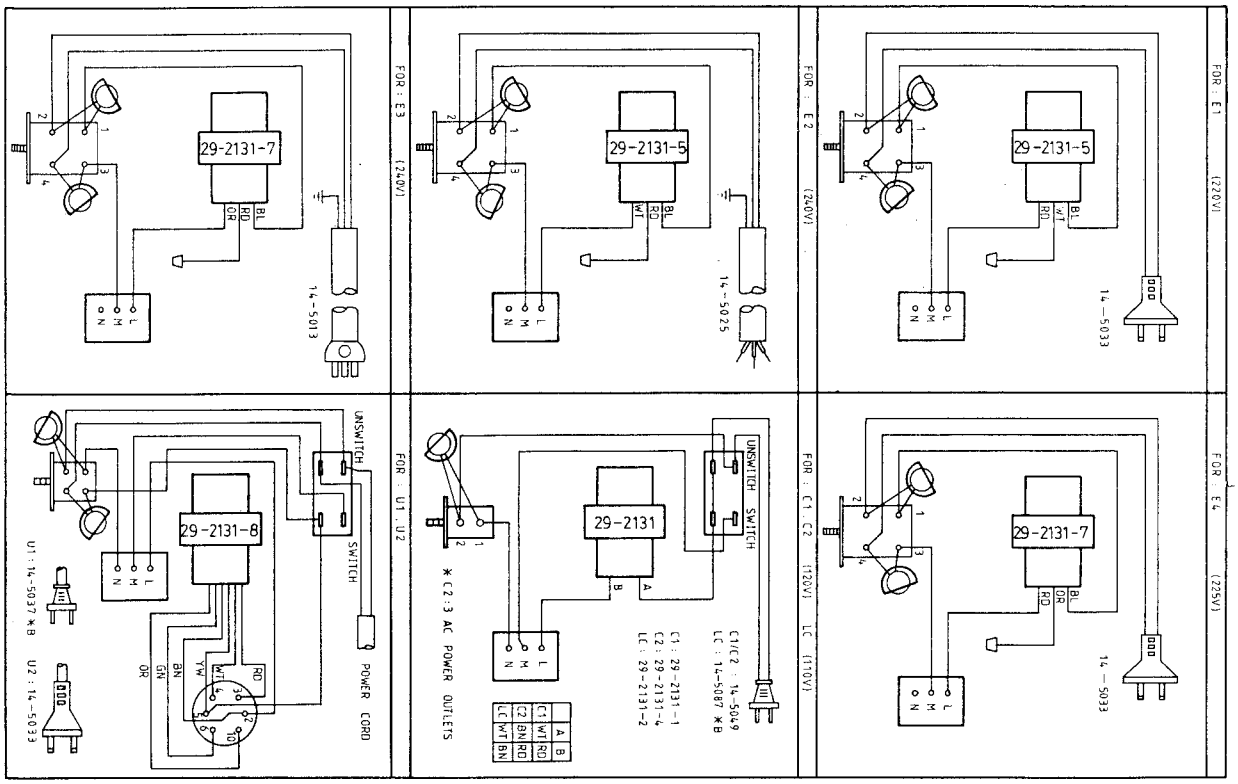
IDLE CURRENT ALIGNMENT

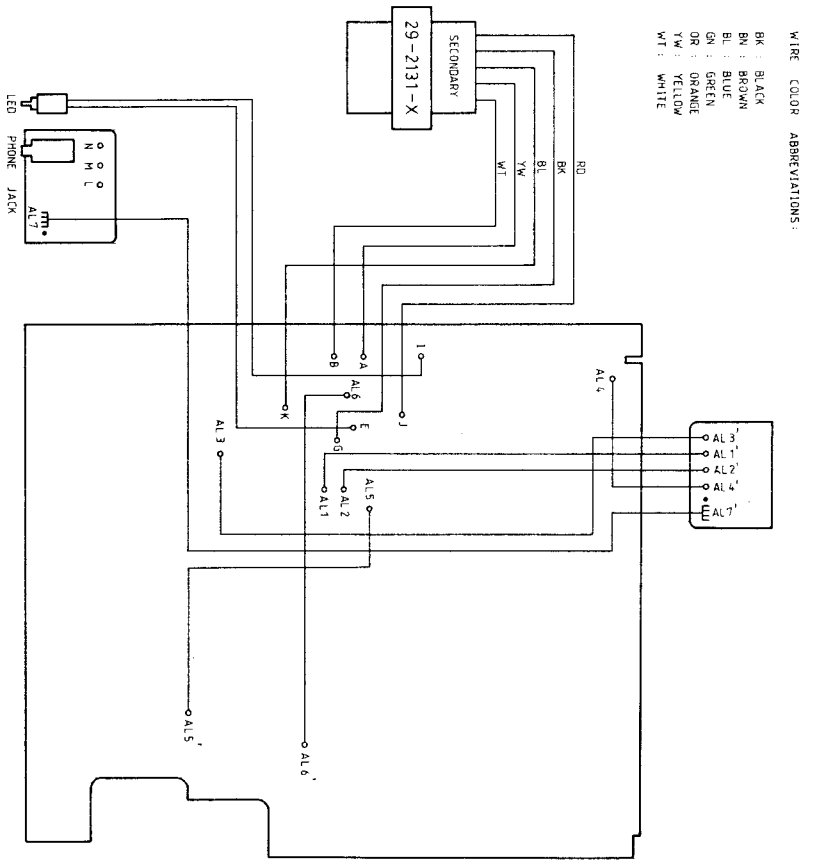
1. Turn VR601,VR602 to fully counter clockwise position.
2. Push on POWER for 5 minutes pre-heating.
3. Set the volume control at minimum position.
4. Remove the load from speaker terminals.
5. Unsolder each solder joint on R631,R632 which were be shorted in the circuitry, than soldering 1 OHM ¼ Watt carbon resistor on R631,R632 position.
6. Connect DC millivolt-meter across R631 for right channel and R632 for left channel. The meter sensitivity should be set at 100mV full scale deflection.
7. Adjust VR601 and VR602 properly so that the reading of meter is between 25mV and 50mV, the alignment is completed.
8. Next to short the R631 (right channnel) and R632 (left channel) 1 OHM resistors.

PACKING DIAGRAM

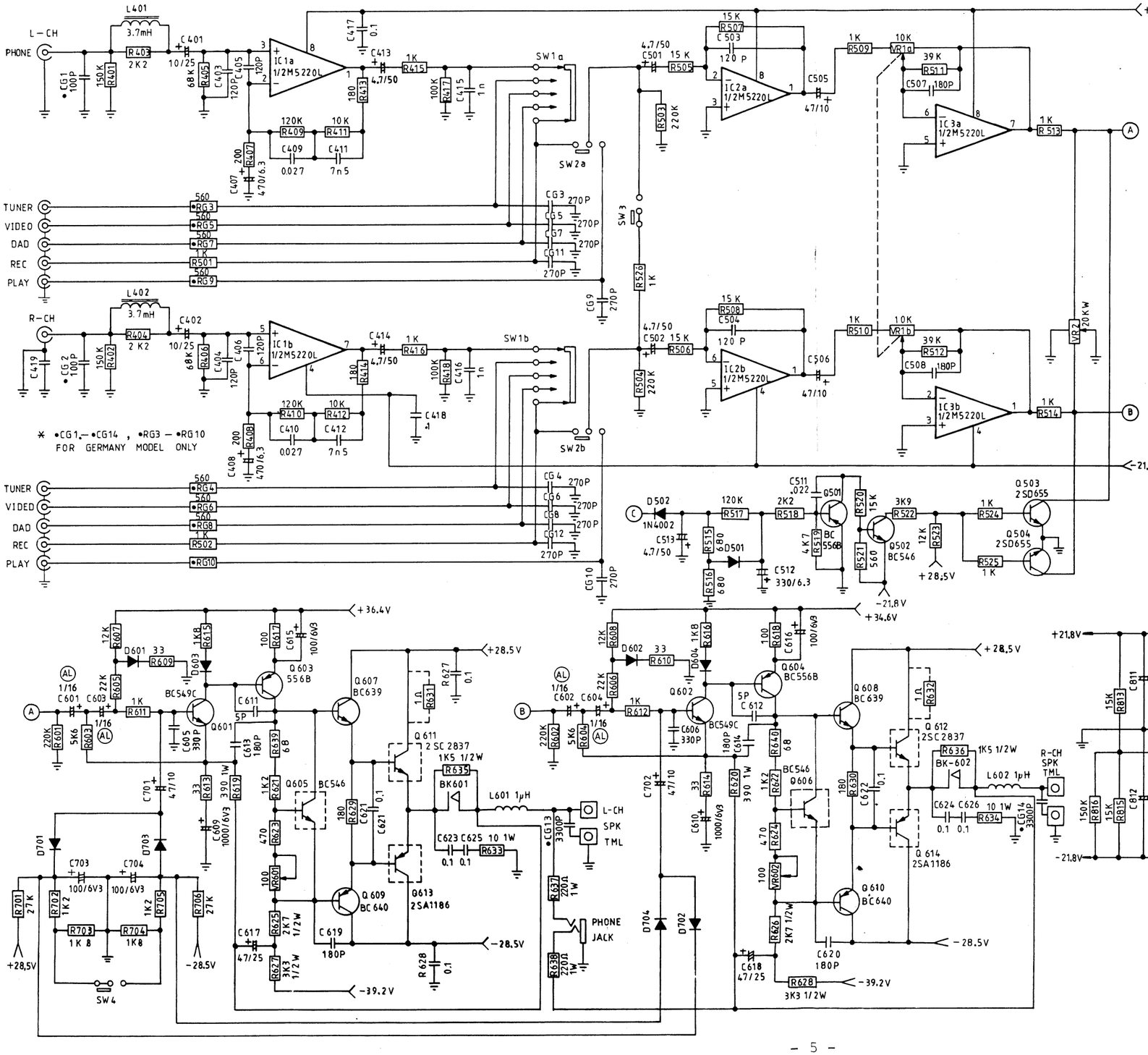


WIRING DIAGRAM





CIRCUIT DIAGRAM



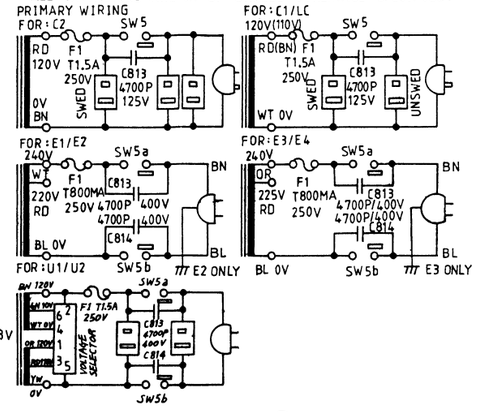
NOTE:
SW1a,b : SOURCE SELECTOR.
SW2a,b : TAPE
SW3 : MONO/STEREO
SW4 : ACC

SW5 : POWER SWITCH
VR1a,b : VOLUME CONTROL
VR2 : BALANCE CONTROL
VR601 VR602 : IDLE CURRET ADJ

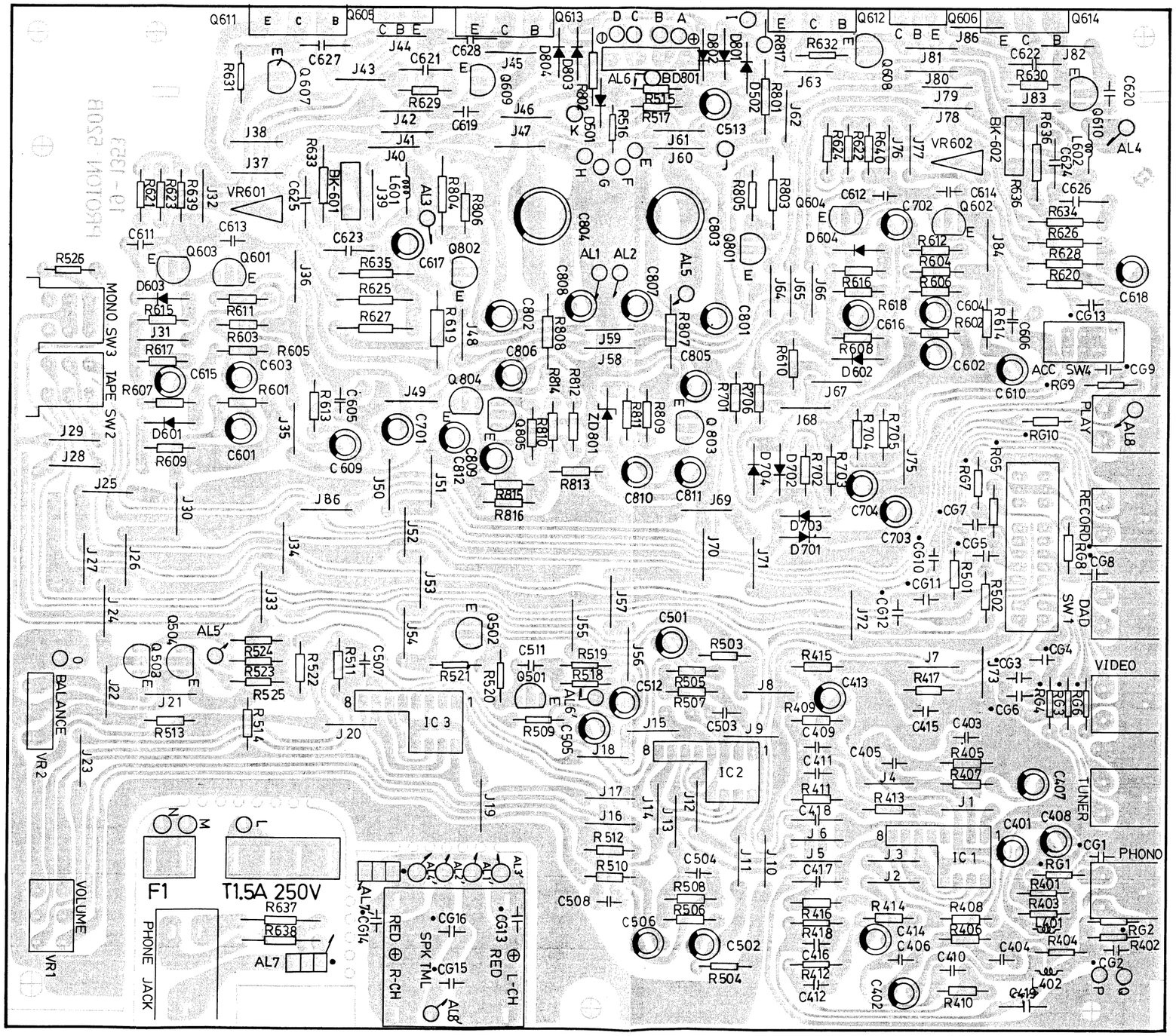
- ALL RESISTOR ARE 1/4W ±5% CARBON UNLESS OTHERWISE SPECIFIED.
- ALL DIODE ARE 1N4148 UNLESS OTHERWISE SPECIFIED.
- ▭ MEANS MOUNT ON COMMON HEAT SINK.
- * MEANS R631 R632 WILL BE SHORTED AFTER IDLE CURRET ALIGNMENT.

ALL CAPACITORS ARE IN UF UNLESS OTHERWISE SPECIFIED.

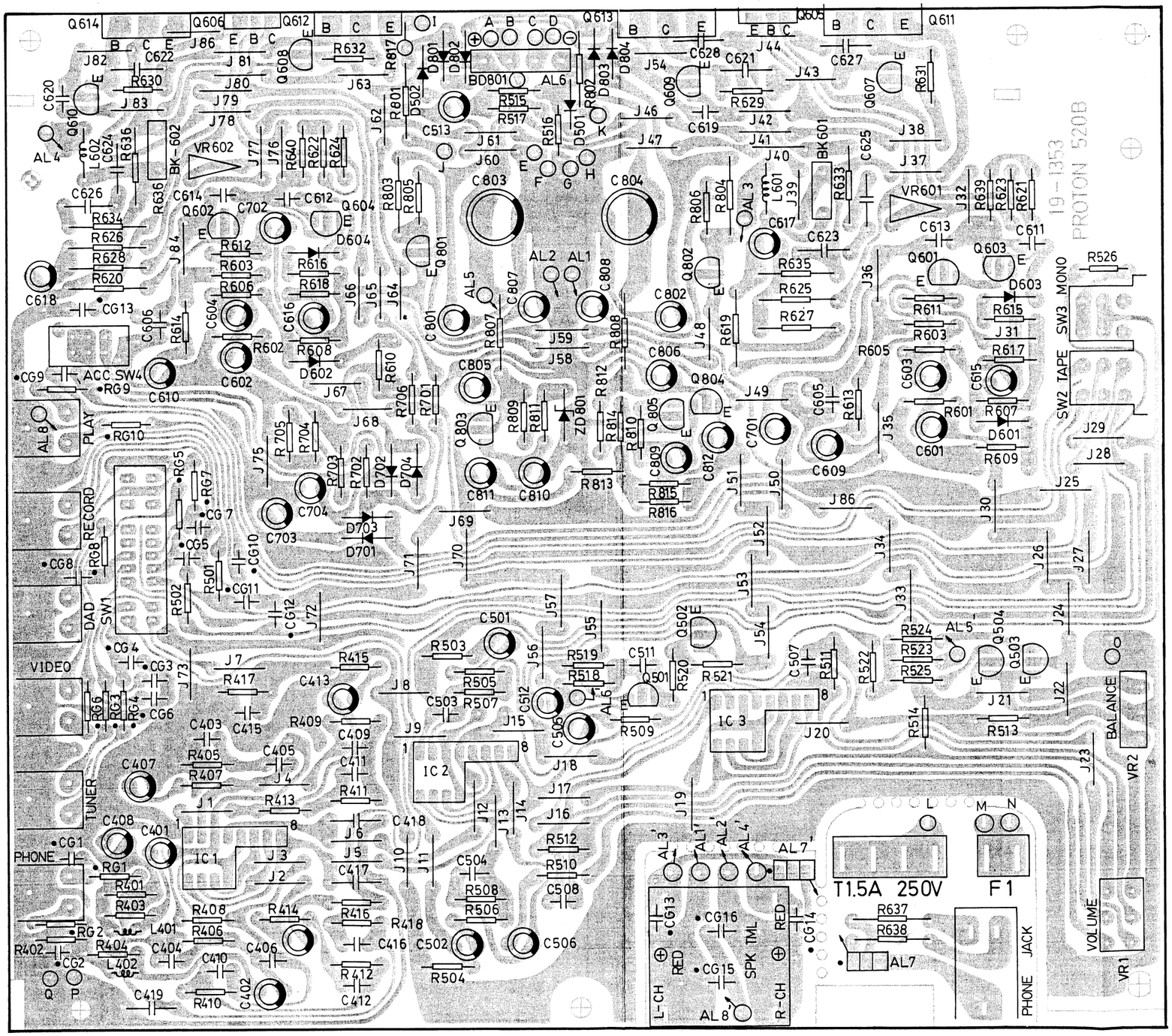
PRIMARY WIRING



PCB PARTS LOCATION (TOP VIEW)



PCB PARTS LOCATION (BOTTOM VIEW)



ELECTRICAL PARTS LIST

REF. NO.	PART. NO.	DESCRIPTION
RESISTORS (All are carbon film 1/4W +-5% unless noted otherwise).		
R401-R402	16-1/4CA154J	150k OHM
R403-R404	16-1/4CA222J	2k2 OHM
R405-R406	16-1/4CA683J	68K OHM
R407-R408	16-1/4CA201J	200 OHM
R409-R410	16-1/4CA124J	120K OHM
R411-R412	16-1/4CA103J	10K OHM
R413-R414	16-1/4CA181J	180 OHM
R415-R416	16-1/4CA102J	1K OHM
R417-R418	16-1/4CA104J	100K OHM
R501-R502	16-1/4CA102J	1K OHM
R503-R504	16-1/4CA224J	220K OHM
R505-R508	16-1/4CA153J	15K OHM
R509-R510	16-1/4CA102J	1K OHM
R511-R512	16-1/4CA393J	39K OHM
R513-R514	16-1/4CA102J	1K OHM
R515-R516	16-1/4CA681J	680 OHM
R517	16-1/4CA124J	120K OHM
R518	16-1/4CA222J	2K2 OHM
R519	16-1/4CA472J	4K7 OHM
R520	16-1/4CA153J	15K OHM
R521	16-1/4CA561J	560 OHM
R522	16-1/4CA392J	3K9 OHM
R523	16-1/4CA123J	12K OHM
R524-R525	16-1/4CA102J	1K OHM
R601-R602	16-1/4CA224J	220K OHM
R603-R604	16-1/4CA562J	5K6 OHM
R605-R606	16-1/4CA223J	22K OHM
R607-R608	16-1/4CA123J	12K OHM
R609-R610	16-1/4CA330J	33 OHM
R611-R612	16-1/4CA102J	1K OHM
R613-R614	16-1/4CA330J	33 OHM
R615-R616	16-1/4CA182J	1K8 OHM
R617-R618	16-1/4CA101J	100 OHM
⚠ R619-R620	16-1AS391J	390 OHM
R621-R622	16-1/4CA122J	1K2 OHM
R623-R624	16-1/4CA471J	470 OHM
R625-R626	16-1/2CS272J	2K7 OHM
R627-R628	16-1/2CS332J	3K3 OHM
R629-R630	16-1/2CA181J	180 OHM
R631-R632	16-1/4CN1R0J	1 OHM
⚠ R633-R634	16-1AS100J	10 OHM
R635-R636	16-1/2CS152J	1K5 OHM
⚠ R637-R638	16-1AS221J	220 OHM
R701	16-1/4CA273J	27K OHM
R702	16-1/4CA122J	1K2 OHM
R703-R704	16-1/4CA182J	1K8 OHM
R705	16-1/4CA122J	1K2 OHM
R706	16-1/4CA273J	27K OHM
⚠ R801-R802	16-1AN3R3J	3.3 OHM
⚠ R803-R804	16-1/2AS181J	180 OHM
R805-R806	16-1/4CA333J	33K OHM
⚠ R807-R808	16-1/2AS470J	47 OHM
R809-R811	16-1/4CA102J	1K OHM
R812	16-1/4CA182J	1K8 OHM
R813	16-1/4CA153J	15K OHM
R814	16-1/4CA102J	1K OHM
R815	16-1/4CA153J	15K OHM
R816	16-1/4CA154J	150K OHM
R817	16-1/4CR562J	5K6 OHM
*RG3-*RG10	16-1/4CA561J	560 OHM

REF.NO.	PART. NO.	DESCRIPTION	
CAPACITORS			
C401-C402	17-2.5ER106Y	ELECTROLYTIC	10uF 25V +50-10%
C403-C406	17-5DR121K	CERAMIC	120P 50V +-10%
C407-C408	17-0.63EF477Y	ELECTROLYTIC	470uF 6.3V +50-10%
C409-C410	17-5FR273J	MYLAR	0.027uF 50V +-5%
C411-C412	17-5FR752J	MYLAR	0.0075 50V +-5%
C413-C414	17-5ER475Y	ELECTROLYTIC	4.7uF 50V +50-10%
C415-C416	17-5DR102K	CERAMIC	1000P 50V +-10%
C417-C418	17-5DH104Z	CERAMIC	0.1uF 50V +80-20%
C501-C502	17-5ER475Y	ELECTROLYTIC	4.7uF 50V +50-10%
C503-C504	17-5DR121K	CERAMIC	120P 50V +-10%
C505-C506	17-1ER476Y	ELECTROLYTIC	47uF 10V +50-10%
C507-C508	17-5DR181K	CERAMIC	180P 50V +-10%
C511	17-5FR223J	MYLAR	0.022uF 50V +-5%
C512	17-0.63EF337Y	ELECTROLYTIC	330uF 6.3V +50-10%
C513	17-5ER475Y	ELECTROLYTIC	4.7uF 50V +50-10%
C601-C602	17-1.6RR105K	ALSICON	1uF 16V +-10%
C603-C604	17-1.6RR105K	ALSICON	1uF 16V +-10%
C605-C606	17-5DR331K	CERAMIC	330P 50V +-10%
C609-C610	17-0.63EF108Y	ELECTROLYTIC	1000uF 6.3V +50-10%
C611-C612	17-5DR5ROC	CERAMIC	5p 50V +-0.25P
C613-C614	17-5DR181K	CERAMIC	180P 50V +-10%
C615-C616	17-0.63ER107Y	ELECTROLYTIC	100uF 6.3V +50-10%
C617-C618	17-2.5ER476Y	ELECTROLYTIC	47uF 25V +50-10%
C619-C620	17-5DR181K	CERAMICLYTIC	180P 50V +-10%
C621-C622	17-5DH104Z	CERAMIC	0.1uF 50V +80-20%
C623-C624	17-5DH104Z	CERAMIC	0.1uF 50V +80-20%
C625-C626	17-5DH104Z	CERAMIC	0.1uF 50V +80-20%
C627-C628	17-5DH104Z	CERAMIC	0.1uF 50V +80-20%
C701-C702	17-1ER476Y	ELECTROLYTIC	47uF 10V +50-10%
C703-C704	17-0.63ER107Y	ELECTROLYTIC	100uF 6.3V +50-10%
C801-C802	17-5EF337Y	ELECTROLYTIC	330uF 50V +50-10%
C803-C804	17-5P478Y	ELECTROLYTIC	4700uF 50V +50-10%
C805-C806	17-3.5EF107Y	ELECTROLYTIC	100uF 35V +50-10%
C807-C808	17-5ER336Y	ELECTROLYTIC	33uF 50V +50-10%
C809	17-2.5ER476Y	ELECTROLYTIC	47uF 25V +50-10%
C810	17-2.5ER106Y	ELECTROLYTIC	10uF 25V +50-10%
C811-C812	17-2.5ER476Y	ELECTROLYTIC	47uF 25V +50-10%
C813	17-2014	CAPA	4700pF 400VAC KC
*CG1-*CG2	17-5DR101K	CERAMIC	100P 50V +-10%
*CG3-*CG12	17-5DR271K	CERAMIC	270P 50V +-10%
*CG13-*CG14	17-5DR332K	CERAMIC	3300P 50V +-10%0%
DIODE			
D501	30-1152TA	IN4148	
⚠ D502	30-1002	IN4002	
D601-D602	30-1152TA	IN4148	
D603-D604	30-1152TA	IN4148	
D701-D702	30-1152TA	IN4148	
D703-D704	30-1152TA	IN4148	
⚠ D801-D802	30-1002	IN4002	
⚠ D803-D804	30-1002	IN4002	
ZD801	30-1041-1TA	ZENER 22V Hz22-2	
⚠ BD801	30-1049	BRIDGE 200V 3A KBL02	
POWER	30-1200	LED RD LTL-1214A	
TRANSISTOR			
Q501	30-2096-2TR	BC556B	
Q502	30-2090TR	BC546	
Q503-Q504	30-2359	2SD655E	

REF. NO.	PART. NO.	DESCRIPTION
Q601-Q602	30-2084-3TR	BC549C
Q603-Q604	30-2096-2TR	BC556B
Q605-Q606	30-2090TR	BC546
Q607-Q608	30-2353TR	BC639
Q609-Q610	30-2354TR	BC640
Q611-Q612	30-2384	2SC2837
Q613-Q614	30-2383	2SA1186
Q801	30-2090TR	BC546
Q802	30-2096-2TR	BC556B
Q803	30-2353TR	BC639
Q804	30-2354TR	BC640
Q805	30-2096-2TR	BC556B
INTEGRATED CIRCUITS		
IC1a-IC1b	30-3272	DUAL OP ML5220
IC2a-IC2b	30-3272	DUAL OP ML5220
IC3a-IC3b	30-3272	DUAL OP ML5220
MISCELLANEOUS		
L401-L402	29-1175	COIL 3.7MH +20-10%
L601-L602	29-1224	COIL AIR 1UH STRAIGHT
SW1	31-1300	SE ROT SRER 044P04
SW2-SW3	31-1352	SW PUSH SUF21AE008-FL
SW4	31-1276	SW PUSH SPJ222NE01-FL
VR1a-VR1b	29-4272	VR 16Ø 10KB
VR2	29-4249	VR 16Ø 20KB
VR601-VR602	VR01-F08101B	SEMI-FIX 8Ø 100B FLAT
BK601-BK602	35-3011	BREAKER A-22
AL7-AL7'	WA-0D03-350K	JUMPER LEAD ASSY 3X350MM
	CN07-SR2502-013	2P SOCKET 450MM
	14-4227	WIRE 2P 230MM
	12-2078	PHONE JACK LT306D-HW
	12-2093	SOCKET 6P
	12-2184	SPK 4P SCREW TERMINAL BORAD
	12-7006	TUBE 1.6X8
	W8-0A065	TUBING PVC UL/CSA 6.5Ø BK
	11-3025	LUG FUSE HOLDER
	11-3022	LUG FUSE HOLDER
	32-11501W	FUSE 6.3X32MM UL/CSA SLOW 1.5A
	32-18000S	FUSE 5X20MM SEMKO SLOW 800mA
	29-1272	SW POWER PUSH ESB8213V
	29-1292	SW POWER PUSH ESB-90702V
	14-5049	POWER CORD SPT-2 #18 PLUG W/P
	14-5033	POWER CORD 2X0.75 SQMM PLUG DNSF
	14-5025	POWER CORD 3X0.75 SQMM UK
	14-5013	POWER CORD 3X0.75 SQMM PLUG SAA
	14-5037*B	POWER CORD SPT-2 #18 PLUG
	29-2131-1	XFMR EI-76 120V CSA
	29-2131-4	XFMR EI-76 120V UL
	29-2131-5	XFMR EI-76 220V/240V DNSF
	29-2131-7	XFMR EI-76 225V/240V
	29-2131-2	XFMR EI-76 110V
	29-2131-8	XFMR EI-76 MULTI-V
	12-2193	RECEPTACLE UL/CSA AC-T05FB13
	12-2194	RECPTACLE UL/CSA AC-T01FB33

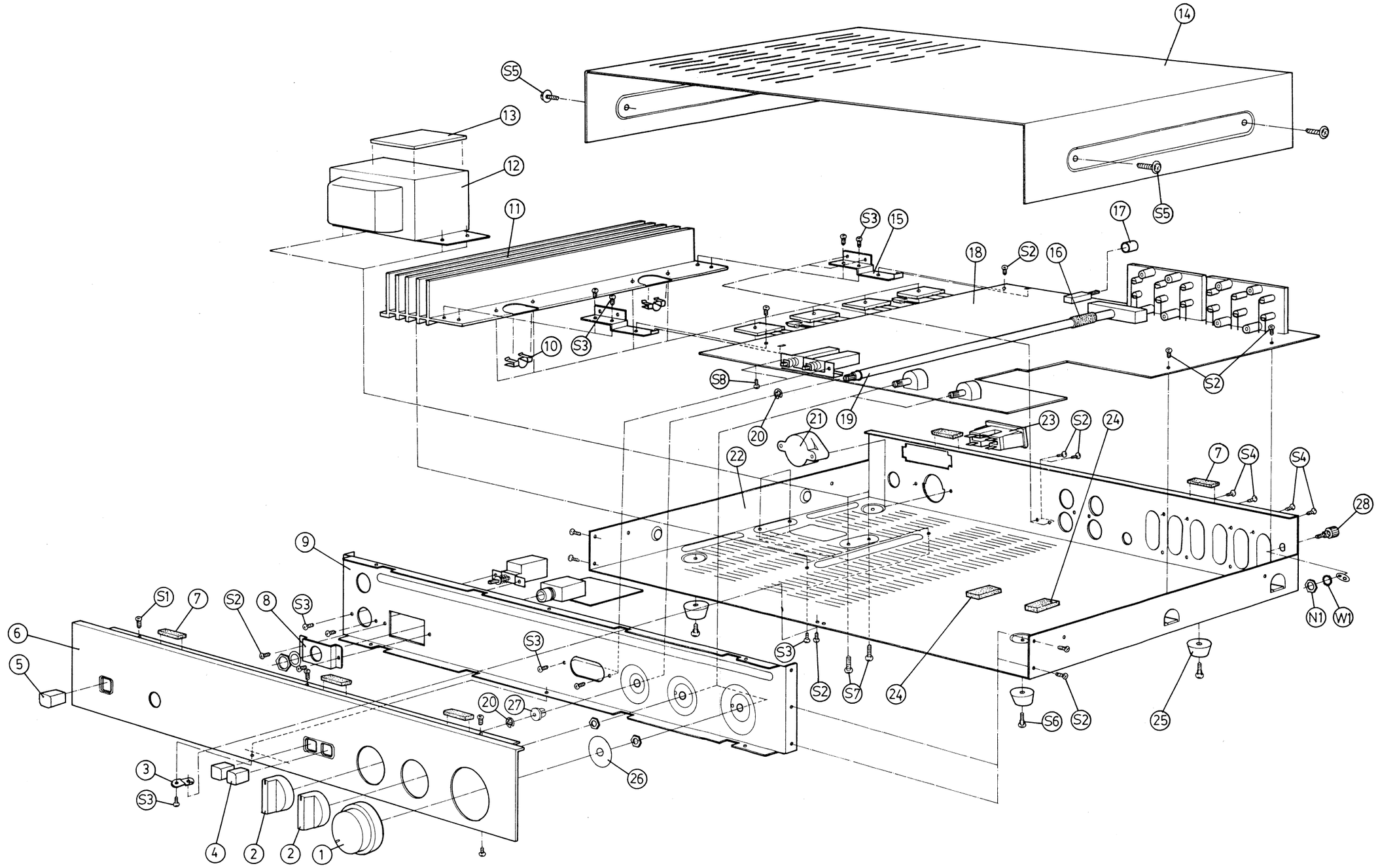
NOTE: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

**RG3-*RG10, *CG1-*CG14 FOR GERMANY only.

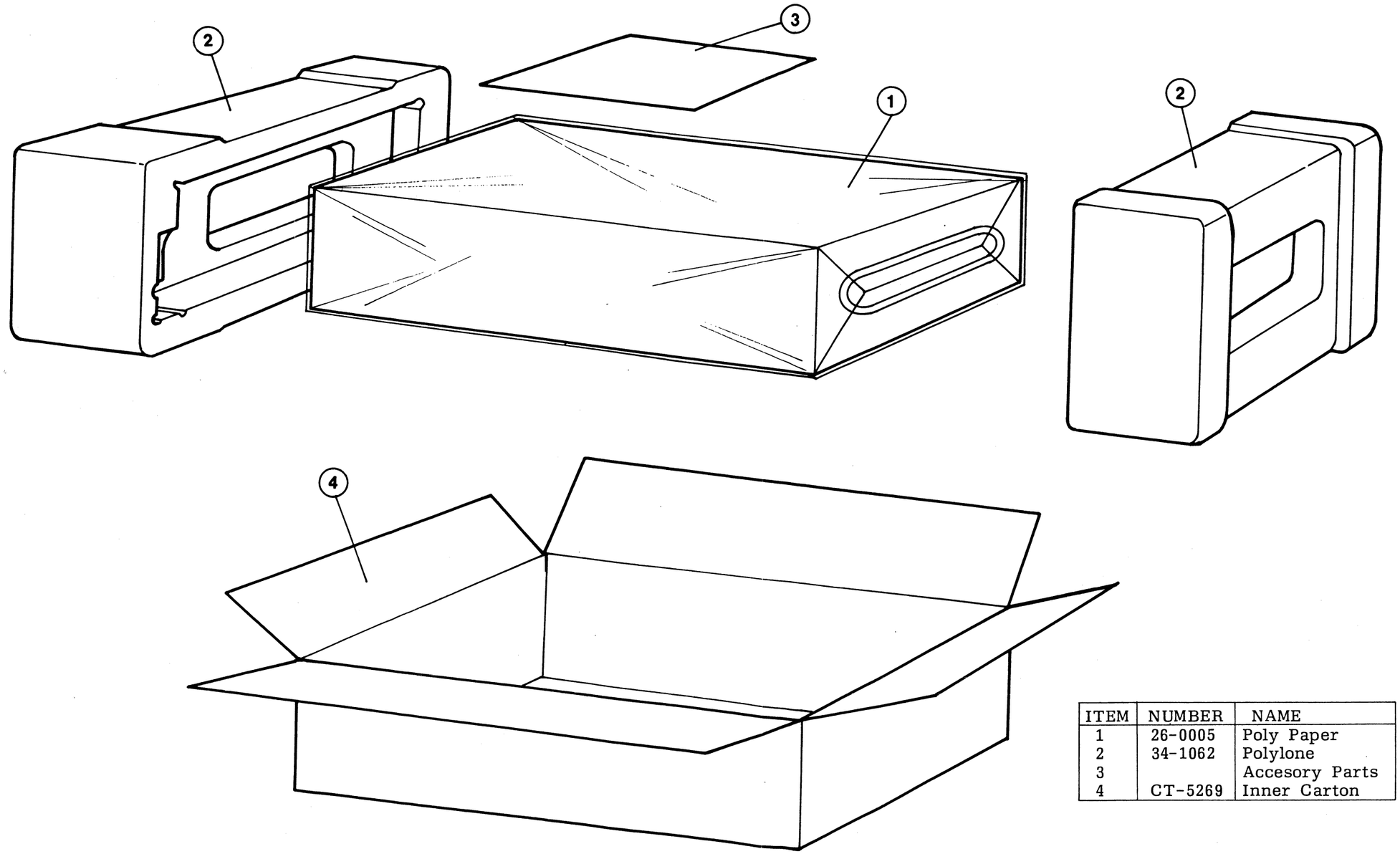
MECHANICAL PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION	Q'TY
1	12-3168	VOLUME KNOB	1
2	12-3T10	CONTROL KNOB	2
3	11-2398	PANEL BRACKET	1
4	12-3T08	PUSH KNOB BK	2
5	12-3T07	PUSH KNOB GR	1
6	11-8371	FRONT PANEL	1
7	28-2090	RETAINER	6
8	11-2328	PHONE'S BRACKET	1
9	11-6190	FRONT CHASSIS	1
10	11-3075	TR HOLDER	2
11	11-5082	HEAT SINK	1
12	29-2131-8	TRANSFORMER	1
13	28-2124	RUBBER RETAINER	1
14	50-1045	CABINET	1
15	11-2381	BRACKET	2
16	12-7003	TUBE	1
17	12-3T02-1	PUSH KNOB ROUND	1
18	90-1353	MAIN PCB	1
19	11-7076	SHAFT	1
20	15-5014	E-RING	2
21	31-1295	VOLTAGE SELECTOR	1
22	11-8356-1	MAIN CHASSIS & BACK PANEL	1
	-2	MAIN CHASSIS & BACK PANEL	1
	-3	MAIN CHASSIS & BACK PANEL	1
	-4	MAIN CHASSIS & BACK PANEL	1
	-5	MAIN CHASSIS & BACK PANEL	1
23	12-2193	AC RECEPTACLE	1
24	28-2134	RETAINER	2
25	28-1029	RUBBER FOOT	4
26	28-2120	MASKER	1
27	13-4027	SHAFT TUBE	1
28	15-2037	GROUND SCREW	1
S1	S1E03+I06SL-2	FLATE SCREW M3x6	5
S2	S2B03+I06SL-2	TAPPING SCREW T3x6	13
S3	S1B03+I06SL-2	MACHINE SCREW M3x6	11
S4	S2B03+I08SL	TAPPING SCREW T3x8	10
S5	15-2062	SPECIAL SCREW M4x8	4
S6	15-2063	STAND SCREW	4
S7	S1B04+I08SL-2	MACHINE SCREW M4x8	4
S8	S1B03+I08SL-2	MACHINE SCREW M3x8	4
N1	N3.5B06I2.8SN	NUT 3.5x2.8T	1
W1	A3.5I07SZ01	GEAR WASHER 3.5x1T	1

ASSEMBLY DIAGRAM



BLOCK DIAGRAM



ITEM	NUMBER	NAME
1	26-0005	Poly Paper
2	34-1062	Polylone
3		Accesory Parts
4	CT-5269	Inner Carton